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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

CHANG, VICTOR S

ART UNIT

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/549,618	SASAGAWA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	VICTOR S. CHANG	1788	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 February 2011.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 7-15 is/are pending in the application.
- 4a) Of the above claim(s) 9 and 10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7, 8 and 11-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                     |                                                                   |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____                                                         | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### **Introduction**

1. Applicant's submissions filed on 2/16/2011 have been entered. Claims 1-5, 7, 8 and 11-15 are active.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. In response, the grounds of rejection have been maintained as set forth below.

### **Election/Restrictions**

4. Applicants have stated in reply filed 7/13/2010:

The second Election Requirement and second response clarify the meaning of Applicants' first response. Specifically, Applicants elect H-S-H.

### **Rejections Based on Prior Art**

5. Claims 1, 3-5 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holden et al. (US 3265765) in view of Hawkins et al. (US 3935176).

Holden's invention relates to elastomeric block copolymers of monovinyl aromatic hydrocarbons and conjugated dienes. In one embodiment, the block copolymers have a general formula A-C-A, wherein A is non-elastomeric polymer block, and C is an elastomeric polymer block containing an average of 10-40 w% block A monomer (a copolymer block). See col. 2, ll. 63 through col. 3, ll. 9. The elastomeric mid section can be a polymer block of any synthetic elastomer, such as styrene-butadiene copolymer (copolymer block S), etc. See col. 4, ll. 32-35.

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The non-elastomeric block may comprise homopolymer (homopolymer block H), such as polystyrene, etc. See col. 4, ll. 37-39. The C block in A-C-A is a tapered copolymer block. See col. 6, ll. 63-64. The elastomeric block copolymers may be used to form varieties of products, including foam. See col. 7, ll. 56-60.

For claims 1, 4, 5 and 14, styrene reads on the vinyl aromatic monomer, butadiene reads on conjugated diene monomer. Holden is silent about: (1) hydrogenating the elastomeric block copolymer, and the vinyl bond content of the styrene-butadiene copolymer (copolymer block S), prior to hydrogenation, and (2) the specific gravity (density) of the foam. However, regarding (1), Hawkins' invention relates a hydrogenated random copolymer of a conjugated diene and vinyl aromatic compound. Hawkins teaches that variations in the vinyl content of the conjugated diene portion of the unhydrogenated copolymer affect the tensile strength. There is a steady decrease in tensile strength as vinyl content is increased. By adjustment of degree of hydrogenation (i.e. varying mole % saturation), the percent vinyl aromatic content and the vinyl content of the conjugated diene portion, a wide variety of properties in the final material may be obtained. Fig. 1 illustrates that the desired properties are obtained by adjusting the monomer ratios and vinyl bond content, i.e., these are result-effective variables for desired properties for various end uses. It would have been an obvious routine optimization to one of ordinary skill in the art to modify Holden's block copolymer according to Hawkins' teachings, i.e., hydrogenating the elastomeric block of workable amount of vinyl bond content, motivated by the desire to obtain improved properties. Regarding (2), in the absence of any evidence to the contrary the Official notice "it is common and well known that elastomeric foam is useful for cushioning products, and the foam density (specific gravity) is result effective to the cushioning properties"

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has been taken ad admitted prior art. Since Holden teaches that the block copolymers may be used to form variety of products, including foam product, a workable density is deemed to be an obvious routine optimization to one of ordinary skill in the art, motivated by the desire to provide required cushioning properties for the same end uses as the claimed invention. Finally, regarding the component (B), since it is optional (0 part by weight), it is not a required limitation by the prior art, therefore it has not been given a patentable weight.

For claim 3, the absence of a crystallization peak to hydrogenated random styrene butadiene copolymer is deemed to be an inherent property to the same chemistry of a random copolymer composition.

For claims 13 and 15, since the collective teachings of prior art render the general composition of the claimed invention obvious, and useful for variety applications including elastomeric foam, a workable impact resilience is deemed to be an obvious routine optimization to one of ordinary skill in the art, motivated by the desire to provide required properties for the same end uses as the claimed invention. Finally, elastomeric foam is inherently a shock absorber.

6. Claims 2, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holden et al. (US 3265765) in view of Hawkins et al. (US 3935176) and Karande et al. (WO 02/068529).

The teachings of prior art are again relied upon as set forth above.

For claim 2, prior art lacks a teaching of a blend of elastomeric block copolymer with olefin polymer. However, Karande's invention relates to an article prepared from a blend comprising 0 to 50 wt% of hydrogenated random styrene butadiene copolymer (copolymer block

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S). See pp. 3. Foamed articles are used for various cushions, etc. See pp. 11. The blend comprises from 30 to 95 wt% of propylene copolymer, such as ethylene propylene copolymer (rubbery olefin polymer), for an improved impact resistance. See pp. 3 and 8. It would have been obvious to one of ordinary skill in the art to similarly modify the hydrogenated elastomeric block copolymer, which is rendered obvious by prior art as set forth above, by blending with the ethylene propylene copolymer, motivated by the desire to obtain improved impact resistance.

For claims 11 and 12, Karande discloses that the blend may include styrenic block copolymers, such as styrene-butadiene-styrene, etc., in an amount up to 50 wt%. See pp. 3 and 9.

7. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holden et al. (US 3265765) in view of Hawkins et al. (US 3935176) and Shibata et al. (US 5191024).

The teachings of prior art are again relied upon as set forth above.

For claims 7 and 8, prior art is silent about a hydrogenated styrene butadiene copolymer bonded to a modifier having an amine functional group. However, Shibata's invention relates to a modified hydrogenated diene block copolymer having excellent processability and weather resistance, impact resistance and flexibility, etc. See col. 1, ll. 5-13. The modified block of alkenyl (vinyl) aromatic compound-conjugated diene copolymer has at least one functional group selected from the group consisting of acid anhydride group, carboxyl group, hydroxyl group, amino group. See col. 2, ll. 2-26. It would have been obvious to one of ordinary skill in the art to modify the block copolymers, which were rendered obvious as set forth above, with a modified hydrogenated styrene butadiene copolymer with an amino group of Shibata, motivated by the desire to obtain various improved properties.

### Response to Arguments

8. Applicants argue at Remarks page 9:

Hawkins '176 has no teaching or suggestion about a peak of loss tangent of a polymer as referred to in feature (IV) of the hydrogenated copolymer (A).

Holden '765 and Hawkins '176 do not have any teaching or suggestion about at least feature (II) (i.e., feature on vinyl bond content) and feature (IV) (i.e., feature on peak of loss tangent) of the hydrogenated copolymer (A). In this connection, it should be noted that, even if Holden '765 or Hawkins '176 has any teaching or suggestion about feature (II), this teaching or suggestion never gives any teaching or suggestion about feature (IV), because ... feature (IV) is never inherent to a polymer having features (I) to (III).

However, the grounds of rejection is 103 based, not 102. Applicants' arguments directed to Holden individually ignore the collective teachings of prior art render all the structure and composition of the claimed invention obvious, and the peak of loss tangent in feature (IV) is deemed to be inherent to the same structure and composition.

Applicants argue at page 10:

Holden '765 and Hawkins '176 do not teach or suggest that, by the use of the hydrogenated copolymer (A) recited in claim 1 of the present application, there can for the first time be obtained a polymer foam which exhibits excellent properties with respect to all of flexibility, low temperature characteristics (such as flexibility at low temperatures), shock-absorbing property (low impact resilience) and compression set resistance. In this connection, it should be noted that these references do not refer to a peak of loss tangent of a polymer, let alone the effect achieved by controlling the peak of loss tangent within a specific range.

However, in the absence of any evidence to the contrary the Official notice "it is common and well known that elastomeric foam is useful for cushioning products, and the foam density (specific gravity) is result effective to the cushioning properties" has been taken ad admitted

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prior art. Since Holden teaches that the block copolymers may be used to form variety of products, including foam product, workable density and peak of loss tangent of the block copolymer are deemed to be an obvious routine optimizations to one of ordinary skill in the art, motivated by the desire to provide required cushioning properties for the same end uses as the claimed invention.

Applicants argue at page 10:

The properties desired to be achieved in Hawkins '176 are completely different from the properties desired to be achieved in the present invention. Specifically, Hawkins '176 intends to obtain a thermoplastic elastomeric material having good thermoplastic elastomeric properties, specifically, good tensile strength and good elongation set (see column 3, lines 15-25 and 44-54 and column 4, lines 5-25 of Hawkins '176). On the other hand, the present invention intends to obtain a polymer foam having excellent properties with respect to flexibility, low temperature characteristics (such as flexibility at low temperatures), shock-absorbing property (low impact resilience) and compression set resistance. For example, the present invention manipulates the vinyl bond content to impart excellent shock-absorbing property (low impact resilience) to the polymer foam.

However, applicants appear to be arguing that the foamed polymer properties is unrelated to the solid polymer the foam is based upon. However, one of ordinary skill in the art would have instantly envisage that selecting a suitable elastomer is critical to the resulting foamed product.

The examiner asserts that Hawkins teaches an improvement to the chemical structure of an element of Holden, it would have been an obvious modification to one of ordinary skill in the art to modify Holden as set forth above. Since Holden teaches that the block copolymers may be used to form variety of products, including foam product, an improvement in the property of the modified foam product is also deemed to be expected.



### **Conclusion**

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to VICTOR S. CHANG whose telephone number is (571)272-1474. The examiner can normally be reached on 6:00 am - 4:00 pm, Tuesday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample can be reached on 571-272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Victor S Chang/  
Primary Examiner, Art Unit 1788